

# Climate Action Report

Calendar  
Year  
2014



Executive Summary

2014 GHG Emissions Results

2020 GHG Emissions Targets

Resiliency and Preparedness Planning

City of Roanoke, Virginia



**DEPARTMENT OF GENERAL SERVICES AND SUSTAINABILITY**

Noel C. Taylor Municipal Building  
215 Church Ave. SW, Room 202  
Roanoke, VA 24011

Roanoke Community,

Over the past 10 years, the City of Roanoke has been committed to making both the community and municipal operations more sustainable. Sustainability encompasses a wide range of factors including but not limited to energy efficiency, alternative fuels, community outreach and education, transportation alternatives, and locally sourced products. The city used all these areas to develop a comprehensive plan for the next five years. As outlined in the following pages, the City of Roanoke takes seriously the impact everyday life has on greenhouse gas emissions and climate change.

This abbreviated document is designed to give a snapshot of the community and municipal goals, objectives, and strategies for a particular sustainability focus area. Community goals are focused on external efforts which will impact the daily life of our residents. Conversely, municipal goals are internal practices related to city operations to reduce greenhouse gas emissions. More detailed information can be found on our website at [www.roanokeva.gov](http://www.roanokeva.gov).

Finally, I would like to thank City Council, the City Manager, city staff, volunteers, and interested parties. Your support throughout the years has created a firm foundation to continue moving the Roanoke community toward a cleaner and healthier future.

Sincerely,

Mike Shockley  
Director of General Services and Sustainability  
City of Roanoke

# Executive Summary

This Climate Action Report serves a dual purpose, first as a progress report of previous goals, activities and the final results of the city's initial greenhouse gas (GHG) emission reduction commitment. Next, it outlines the City of Roanoke's newly developed Climate Action Plan's goals, targets, and strategies. This report is a summary and quick overview of the more comprehensive Climate Action Plan, which is available on the city's website at [www.roanokeva.gov](http://www.roanokeva.gov).



*Noel C. Taylor Municipal Building*

On Sept. 18, 2006, Roanoke City Council passed a resolution to join ICLEI - Local Governments for Sustainability, an organization dedicated to improving the global environment through local government initiatives. Roanoke was the first city in Virginia to join ICLEI, establishing an early leadership role in environmental stewardship. In addition, the City Manager expanded the role of the Director of General Services to include accountability for energy and sustainability, changing the title to the Director of General

Services/Sustainability. On Sept. 2, 2008, Roanoke City Council unanimously approved a resolution to adopt greenhouse gas reduction targets for the city and community as a foundation for protecting our environment.

Council committed by resolution to reduce greenhouse gas emissions from municipal operations by a total of 12.5 percent and the community by a total of 10 percent over a five-year period, Jan. 1, 2009 through Dec. 31, 2014.

2008 ICLEI GHG  
Emission - Target Date  
Calendar Year 2014  
(baseline 2005)  
Municipal – 12.5%  
Community - 10%



Over the course of the next five years, the city's municipal operations engaged in a number of extensive energy-saving projects, primarily in the facilities. Roanoke's building stock was aging, maintenance on the buildings was well behind schedule, and equipment was in eminent need of repair. Financing these projects was also a challenge.

Motivated by the potential savings, the city hired a new Facilities Manager with extensive HVAC experience. This manager built an in-house team of highly trained building professionals qualified to do the mechanical work the city's building portfolio required.

Fleet Management employed alternative fuels, hybrid vehicles and innovative technology and practices to improve energy efficiency. The Parks and Recreation, Transportation, and Landscaping crews also reviewed their practices for environmental soundness.

The Engineering Division adopted the U.S. Green Building Council Leadership in Energy and Environmental Design (LEED) for new construction and major renovation.

City departments embraced sustainability and have been progressively improving practices since the ICLEI commitment.

City Council Member Gwen Mason, along with city staff, launched the Clean and Green Initiative. Roanoke Clean and Green initially focused on litter and community beautification but soon expanded to include the ICLEI commitment.

The Citizens for Clean and Green Committee and the Business Environmental Leadership Coalition (later known as the Clean and Green Business Coalition) were formed to increase the community awareness.

## 2014 GHG Emissions Results

Technical support for analyzing and providing the official emissions results are the responsibility of Dr. Sean McGinnis (Virginia Tech, Director of Green Engineering).

Dr. McGinnis has been involved since the beginning of the ICLEI

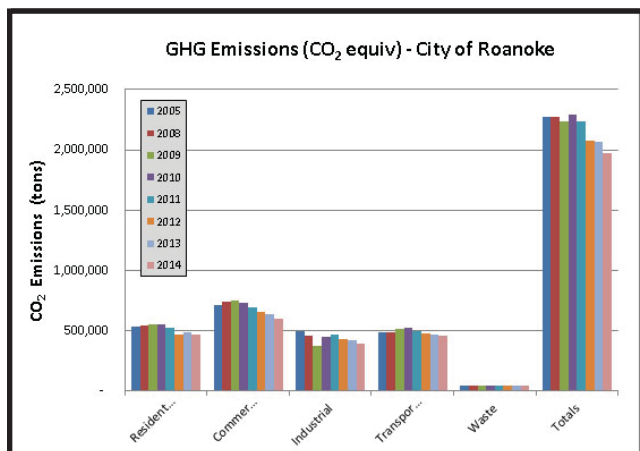
commitment. It is Dr. McGinnis who provides recommendations for appropriate goals and strategies to achieve the desired results.

He communicates all official GHG information to Roanoke City Council. Each year he announces the

community emissions results and the municipal data on the years it is available. Due to the complex data and time needed to calculate, the municipal data is collected less frequently. Therefore, the reporting years are 2005, 2012, and 2014.

### Community 2014 GHG Emissions

SECTOR	2005	2014	% CHANGE	2014 (%)
Residential	536,056	470,546	- 12.2%	23.9%
Commercial	711,951	601,391	- 15.5%	30.5%
Industrial	497,160	397,741	- 20.0%	20.2%
Transportation	489,149	458,708	- 6.2%	23.3%
Waste	42,027	43,293	- 3.0%	2.2%
<b>Totals</b>	<b>2,276,343</b>	<b>1,971,679</b>	<b>- 13.4%</b>	<b>100%</b>



*In 2014, the City of Roanoke saved \$926,714 in avoided energy costs.*

The final results for the original ICLEI commitment were announced to Roanoke City Council on Feb. 1, 2016. Council members were pleased to hear that the community reduction of 13.4 percent exceeded the 10 percent goal. The municipality, through its multiple energy reduction activities, achieved an impressive 25 percent reduction, doubling its original goal of 12.5 percent.

## Municipal 2014 GHG Emissions

GHG emissions (tons CO<sub>2</sub>e)

Municipal Sector	2005	2012	2014	Difference
Buildings	29,480	24,590	21,963	25.5%
Lights	9,661	8,186	7,382	23.6%
Fleet Vehicles	6,648	5,969	4,993	24.9%
<b>Totals</b>	<b>45,789</b>	<b>38,745</b>	<b>34,338</b>	<b>25.5%</b>

**Final Reduction – 25.5%**



# 2020 GHG Emissions Targets

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## Future Outlook

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Roanoke is proud to have achieved the ICLEI goal and, on June 6, 2016, City Council approved a new target for the next reporting period January 2015 through December 2019, building on the current baseline.

The new goals will require a more focused program for city operations, since many of the more easily achieved strategies have been executed in the first phase. Hence, the need for a Climate Action Plan to assist the internal efforts to support such aggressive goals. During the second phase of GHG emissions reductions the city will use this Climate Action Plan as a guide for future activities of the staff of the City of Roanoke.

Emission  
Targets

January 2015  
through  
December 2019

Municipal  
32.5%  
(additional 12.5%)

Community  
23.5%  
(additional 10%)

# Resiliency and Preparedness Planning

Looking ahead, Roanoke incorporates all climate action activity into a broader scope of emergency preparedness and resiliency planning.



By implementing sustainable practices into all of the city's activities the community is strengthened, ensuring more resilience for its response to future weather and disaster events.

The city builds mitigation and adaptation strategies into the Climate Action Plan. Roanoke will be prepared for any number of unforeseen events by improving its infrastructure and emergency services to better respond to changing environmental conditions.

## Background

The focus on energy-saving began strictly as an operational improvement, intended to save the taxpayers money and improve the comfort of the buildings.

As previously mentioned, the Director of General Services/Sustainability opted for a fresh approach to the city's facility mechanical needs.

Hiring third-party contractors can be a time-consuming process and expensive, so the concept of an internal energy team was formed. Beginning with the new Facility

Manager with extensive HVAC experience, the job descriptions were revised and additional funding used to attract more highly skilled technicians.

This team would self-perform many of the upgrades, and complete the operations and maintenance for the city, saving hundreds of thousands of dollars. Since the primary energy-saving target for the city is buildings, in 2005 the facilities staff conducted an internal, comprehensive analysis of major energy use within municipal operations as a first step.

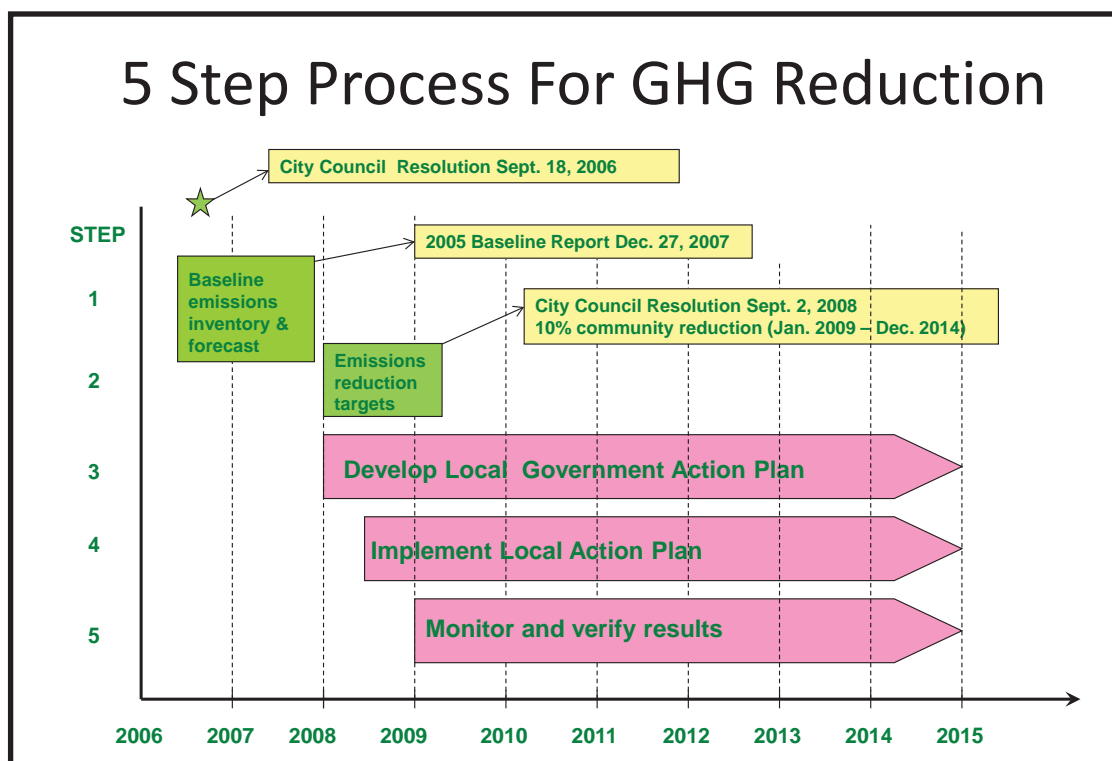
During this analysis, an Energy Improvement Plan was developed, which involved two major components: 1) hiring facility workers with HVAC expertise (not performance contractors) tasked with evaluating heating, lighting, and fuel expenses, exploring opportunities to cut expenses, and discovering alternatives to control heating and fuel costs by 10 percent; and 2) conducting an enterprise-wide HVAC analysis. This served as the framework for the work that would take place over the next 10 years.

# ICLEI and the Five Milestone Process for Sustainability

The city committed to ICLEI and the target community municipal reductions of 10 percent and 12.5 percent respectively. Following the ICLEI protocol this five-step process resulted in numerous efficiencies and would be the city's first effort toward reducing energy consumption and implementing a number of best practices in sustainability. The city adopted the Five Milestone Model to achieve the goals.

## The Five Milestone Model

1. Conducting a baseline emissions inventory and forecast
2. Adopting an emissions reduction target for the forecast year
3. Developing a Local Action Plan
4. Implementing policies and measures
5. Monitoring and verifying results





# Conducting a Baseline Emissions Inventory



*Dr. Sean McGinnis*

Using ICLEI software, city staff worked with the Center for Energy and Sustainability at James Madison University's Shenandoah Valley Air Quality Initiative and Virginia Tech's Green Engineering Program to evaluate and determine the city's baseline carbon footprint. On Jan. 22, 2008, Dr. Sean McGinnis, Director of Virginia Tech's Green Engineering Program, presented Roanoke's 2005 baseline municipal emissions inventory report to City Council.

This report detailed the community's GHG and criteria air pollutant inventory for the city. Dr. McGinnis indicated that the "total greenhouse gas emissions for the City of Roanoke were approximately 2.9 million tons of carbon dioxide equivalent." The initial data and inventory modeling was divided into three main sectors: city buildings, vehicles, and public lighting. The building sector produced the most GHG emissions at 60 percent and had the most energy use and costs associated at 50 percent.

The results further revealed that electricity accounted for 57 percent of carbon emissions due relatively

to the higher carbon intensity of electricity provided to the Roanoke Valley and Southwest Virginia that is primarily generated from coal.

The key learning point was that only 1.9 percent of total carbon emissions were contributed by city government with the remainder 98.1 percent contributed by the residential, commercial, and industrial sectors of the city.

Consequently, increased education and collaborative efforts with the residential, industrial, and commercial sectors of the community would be essential to successfully reducing the city's carbon footprint. Staff

continues to develop a number of strategies to address key resiliency and adaptation of goals. Strategies such as Low Impact Development (LID), conservation of natural habitats and resources, water supply planning, the development of infrastructure improvements to the public water system, landscape connectivity, and efficient land management behaviors all serve as vital components of municipal preparedness planning.

The city has also implemented stormwater management and energy efficiency programs and has continually explored renewable energy strategies.

## Community Outreach Efforts

With initiatives already in place to address municipal emissions, in 2007 Council Member Gwen W. Mason implemented a "Clean and Green" initiative to amplify the city's

efforts in "greening" its internal operations and to launch a community-wide effort to raise awareness among the residential, commercial, and industrial sectors. The cam-

paign's goal was to focus on the importance of reducing the collective carbon footprint through energy conservation, greenhouse gas reduction, waste management, and recycling.

City Council adopted a formal resolution endorsing the campaign which launched on Sept. 18, with the goals of engaging the community in sustainable residential and business practices.

In 2008, the City of Roanoke held an Environmental Summit to educate the public on sustainability and to request public feedback on how to better engage the community in environmental efforts. More than 200 citizen and business representatives from the Roanoke area attended and participated in roundtable discussions regarding

Roanoke's sustainability actions. Ideas emerged from the discussion which focused on the following six priorities: Energy efficiency, transportation, waste management and recycling, education and public awareness, building tax credits and other incentives, and beautification and conservation efforts.

The summit resulted in the establishment of the Citizens for Clean and Green Committee. This committee is composed of concerned citizens, business leaders, and environmental enthusiasts and was tasked with developing a plan of

action for community engagement on environmental issues.

The group was launched in early 2009 and has focused on evaluating the community GHG emissions report (ICLEI Milestone I) and recommending innovative and practical programs to reduce emissions in the commercial and residential sectors.

The work of the Citizens for Clean and Green Committee focuses on the residential sector through education and energy-efficiency programs, as listed below.

## Citizens for Clean and Green Activities

- **Café 2** — The creation of a Southwest Virginia Energy Alliance with partners formed the Community Association for Energy Efficiency or "Café 2" to establish market-based energy efficiency initiatives. The program completed 236 energy audits and 126 energy retrofits over three years. (Partners: Association for Energy Conservation Professionals, Community Housing Partners; Program Complete)
- **"The Biggest Loser" Community Challenge** — A community challenge for city households to see who could reduce energy consumption by the largest amount over one month. The winners were awarded energy-efficient appliances as a prize. (Program Complete)
- **The Green Academy** — By far the most successful and long-lasting program has been the Green Academy. Since 2009 the group hosted six academies. This five-week series is intended to educate citizens about energy conservation, weatherization, renewable energy, and water conservation. This program is free to Roanoke citizens. (Active Program)
- **Save-A-Ton** — Citizens for Clean and Green was a founding member of the outreach campaign Save-A-Ton. This regional partnership leveraged resources to create an award-winning educational campaign with billboards, ads, and promotional materials directing citizens to an interactive website intended to help residents make informed decisions about energy conservation. (Partners: Roanoke County, the Roanoke Valley Regional Commission, Cool Cities Coalition; Program Complete)
- **Solarize Roanoke** — This high-intensity, short-term program made solar easy and affordable. With more than 400 inquires, it added almost 100 kilowatts of clean renewable energy to the Roanoke Valley. (Partner: Community Housing Partners; Program Complete)
- **Weatherize Roanoke** — The newest residential energy program is Weatherize Roanoke, a one-stop shop for your energy needs. With the creation of the website [www.weatherizeroanoke.org](http://www.weatherizeroanoke.org) homeowners can find the fast and easiest way to energy-saving services. There are multiple products available to citizens and Weatherize Roanoke makes the process easy. Citizens in the City of Roanoke will receive free energy-saving tips and products to start saving energy right away. (Local partners: American Electric Power, Roanoke Gas, Community Housing Partners, TAP, and Renovation Alliance; Active Program)
- **Envision Roanoke** — An open-community forum that asks citizens for input on how Roanoke can move toward a greener future. Some of the feedback received has been rolled into this plan to assure that the community's voice is applied to the planning. (Partners: Carilion Clinic and Virginia Western Community College; Active Program)



# Clean & Green Business Coalition

Another significant accomplishment of the city's sustainability outreach efforts was the formation of the Business Environmental Leadership Coalition. On March 14, 2008, 12 major businesses joined forces with the city to create a Business Environment Leadership Coalition.

The group later changed the name to the Clean & Green Business Coalition. In November 2008, the Coalition announced a goal of collectively reducing its carbon emissions by 4 percent per year for 5 years. By 2014, the businesses had achieved a 33 percent absolute combined business reduction goal, concluded with 20 percent real energy savings, reduced carbon emissions by 16,300 tons, and prevented more than \$2 million in avoided energy costs.

To promote these best practices more effectively throughout the community, the city's Director of Gen-



*The Business Coalition held a press conference in November 2008 to announce progress in collectively reducing carbon emissions.*

eral Services/Sustainability hired a Sustainability and Outreach Coordinator in 2012. The Coordinator has been instrumental in facilitating both the city's and the community's sustainability efforts. The business community and citizens are duplicating many of the energy and fuel conservation measures implemented by the city, and members of the community's residential, commercial, and industrial sectors have pledged tiered commitments toward sustainability.

## Members of the Coalition were asked to take the following actions:

- Conduct a carbon inventory
- Encourage conservation through business practices
- Purchase environmentally sound products and supplies and use their power as a consumer to increase vendor awareness
- Designate a staff member to serve as a champion for the environment on behalf of the business

# Moving Forward

With these emission reduction targets in mind, city staff was charged with developing a Climate Action Plan for the Roanoke community and implementing the programs, initiatives, and best practices to the extent practical and achievable within available funding and resources.

Developing a comprehensive planning document which outlines a series of environmental goals, targets, and prioritized strategies for community sustainability represents an all-inclusive approach to enhancing the quality of life for our citizens.

Accomplishing this goal for the city and region implies establishing a continuing evaluation of economic, social, environmental, and quality-of-life indicators—an ongoing assessment of conditions and progress toward the city's collective efforts to decrease its carbon footprint.

This Climate Action Plan builds on the strategies that city administration has already developed and implemented in the city's Vision 2001-2020 Comprehensive Plan to improve Roanoke's preparedness and resilience. The Comprehensive Plan is an integrated set of policies, actions, and strategies designed to successfully position Roanoke as a progressive model city for urban development life in the future.

A significant number of policies included in this plan are essential to maintaining the city's natural environment, protecting its economy and natural

resources, investing in more resilient infrastructure, providing sound support systems to manage climate impacts, and ensuring that Roanoke's operations and facilities protect and serve the citizens of the community.

The goals and strategies addressed in the city's Climate Action Plan will closely align with the strategic priorities identified in the city's Comprehensive Plan and have been brought forward as part of the planning process that will guide investment and decision-making over the next 10 to 20 years.

Through the development of this Climate Action Plan, Roanoke is on the right path to reducing its carbon footprint. However, the city is ever-mindful that the key is not reducing emissions in "Roanoke, the Municipality," but rather reducing emissions in "Roanoke, the Community."

Of course, this will not happen all at once. Instead, with the use of a developed Climate Action Plan template, the city will work with the community to promote timely and consistent action, programs, and policies that will result in reduced annual emissions.

The next phase of energy reduction goals for the City of Roanoke is an additional 10 percent for the community, and 12.5 percent for the municipality by the end of Calendar Year 2019; therefore, positioning the city to continue to be a leader in sustainability and resilient planning for future generations.

## The Compact of Mayors

In November 2015, Roanoke's City Council joined 436 cities from around the world to support the Compact of Mayors.

The Compact of Mayors is a global coalition of city officials committed to reducing greenhouse gas emissions and to track their progress transparently.

This requires the city to adhere to a more stringent level of reporting, as a complimentary program to ICLEI.

Once again, Roanoke has positioned itself as an environmental leader by pledging to the highest standard of environmental accountability.

With the current efforts in place, developing a more comprehensive plan of action to address greenhouse gas emissions and other environmental issues seemed to be the next natural step in the city's process.

This planning process will enable the city to amplify internal and community-wide sustainability efforts, engage the community in energy conservation, provide opportunities for the residential, commercial, and industrial sectors to advance their commitments toward environmental practices, and expand public education and awareness as it relates to sustainability.



# Buildings and Energy

## Goal:

Reduce energy consumption and its impacts within the Roanoke community through conservation, the adoption of emerging tools and technologies, and policies and programs designed to mitigate greenhouse gas emissions.

## Targets:

- Achieve a 3 percent annual reduction in greenhouse gas emissions from city facilities by 2020.
- Decrease Energy Use Intensity (EUI) of existing city buildings by an average of 20 percent by 2020 using a 2009 baseline.
- Achieve a 3 percent aggregate reduction of energy use in residential buildings by 2020 using a 2005 baseline.
- Achieve a 3 percent aggregate reduction of energy use in commercial/industrial and residential buildings by 2020 using a 2005 baseline.
- Achieve green building standards (LEED Certified, Energy Star Certified, etc.) on 100 percent of qualified new construction projects by 2020.
- Complete 15 projects to convert from traditional fossil fuel to a cleaner source of energy.

## Strategies:

### Internal Practices

- Ensure that city facilities and infrastructure are models of energy efficiency.
- Identify system-wide best practices and techniques that reduce energy consumption across all city facilities.
- Decrease the city's portfolio-wide source Energy Use Intensity (EUI).
- Recommend city-financed projects to meet an energy-efficiency standard, such as LEED, Energy Star standards, National Home Builders Association (NHBA) Green Building, and/or Earthcraft.
- Continue to review the city's "Preventative Maintenance Plan" and "Capital Repair Program" to guide efficiency investments in city facilities.



*Better Building Challenge - Berglund Center  
1.7 Million Square Feet - 16% Reduction*



- Explore the purchase of electricity from solar photovoltaic systems (solar infrastructures) hosted on government facilities and assist with the recruitment of businesses in the community to adapt similar strategies.

## Residential, Commercial, Industrial Sectors

- Assist with and support programs such as Weatherize Roanoke for residential market-rate home energy efficiency.
- Provide technical assistance to residential and commercial owners to retrofit historic buildings, recognizing the emission-reduction benefits of retaining existing buildings instead of building new ones.
- Support and promote the community's commitment to low-income weatherization programs through Total Action for Progress' (TAP) Home Weatherization Assistance program.
- Connect and collaborate with other sustainability efforts.

*Solarize Roanoke was a limited-time offer based on volume participation:*

- 18 contracts signed
- 95 kW installed
- 5.17 kW average installation

## General

- Identify and target the potential energy savings from the commercial and industrial sectors.
- Promote public-private partnerships in order to organize and reach out to the residential and business sector, necessitating efforts that businesses can undertake to reduce their energy usage.
- Support and promote programs, policies, and enabling legislation that strengthen sustainability initiatives in the community.
- Support the adoption and implementation of emissions reductions plans by other entities and institutions.
- Provide education and outreach efforts designed to promote the reduction of community-wide energy use.
- Support and promote demand response strategies and other technologies in the community to help meet consumer

*Photo courtesy of Roanoke Valley Television*



*A press conference was held at the City Market Building to kick off the Solarize Roanoke Program.*

demand, detect system overloads that could be caused by heat events or other issues, and reroute power to improve system reliability.

- Support and incentivize, when possible, the renewable energy market in the commercial sector.
- Continue to support global advocacy events aimed at educating the public, sharing innovation, and promoting and fostering collaborative opportunities as it relates to energy and renewable energy.

# Transportation

## Goal:

Roanoke will provide a safe, efficient, accessible, user-friendly, and connected multi-modal transportation network of well-designed streets and other infrastructure that accommodates auto, mass transit, rail, pedestrian, and bicycles, while providing greater connectivity, improving mobility, reducing greenhouse gas emissions, and promoting fuel efficiency.



*Salem Avenue in Roanoke*

## Targets:

- Reduce daily vehicle miles traveled in Roanoke by 5 percent by 2020 while increasing transportation choices and improving accessibility.
- Increase public transportation and non-auto modes of transportation for commuting to work by at least 5 percent of city residents by 2020 based on data from the American Community Survey.
- Reduce car reliance and promote cycling, walking, and transit use.
- Construct or designate 20 additional miles of on-street, protected bike lanes by 2020 to allow safe and efficient travel for all types of cyclists.
- Construct 6 miles of paved greenway infrastructure and 11 miles of natural surface greenway on city-owned land by 2020 to provide greater connectivity to housing, public areas, transit facilities, recreational centers, and cultural amenities.



*Bikers on the Greenway*

- Increase the education and outreach regarding the use of hybrid and electric vehicles in the community.
- Increase the number of electrical charging stations in the community from 2 to 10 by 2020.
- Expand the use of clean fuels in all city-owned fleet by 2020.





*Roanoke was the first local government in Southwest Virginia to use biodiesel*

- *Biodiesel is biodegradable and nontoxic*
- *Biodiesel typically produces 60% less net carbon dioxide than Petroleum-based diesel*
- *Biodiesel makes the United States less dependent on foreign oil*

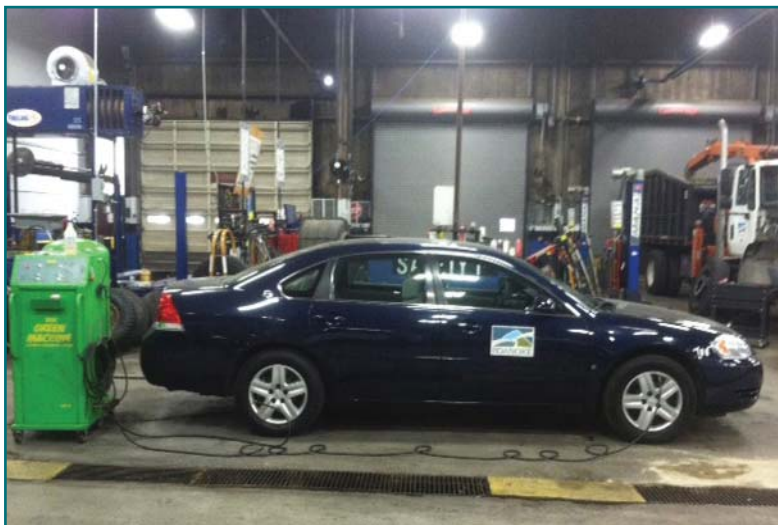
## Strategies:

### General

- Ensure that all transportation agencies within the city routinely plan, fund, design, construct, operate, and maintain streets according to the “Complete Street” principles of the city’s “Street Design Guidelines.”
- Promote bicycling, walking, mass transit, carpooling, telecommuting, and emergency ride home programs as attractive alternatives to driving.
- Improve interdepartmental and interagency collaboration in urban transportation planning.
- Secure grants and other financial and non-financial incentives to support sustainable transportation initiatives.
- Support and promote innovations in alternative transportation such as the use of propane and compressed natural gas as alternative fuels.
- Continue to explore changes to signal timing to reduce idling, improve traffic flow, and accommodate non-auto modes.
- Pursue opportunities to purchase and install LED street lights and traffic signals.

### Fleet

- Support the transition to more efficient vehicles and cleaner fuels through local initiatives and federal and state legislation.
- Continue to explore the use of fuel-saving vehicles, technologies, and practices.
- Support the purchase of electric vehicles (EVs) and provide electric vehicle charging stations and other alternative fueling options at city-owned facilities where feasible.
- Promote collaboration and coordination between the public and private sector to expand the region’s electric vehicle (EV) charging stations.



*Nitrogen in City Tires: Between 2011 and 2013, tire costs were reduced from 24% to 19% of the Fleet budget.*



## Transit and Rail

- Support the enhancement and upgrades of regional and local transit.
- Work with regional and state partners to adopt a funding strategy and advocate for an increase to a dedicated funding stream for transit operations and passenger train service at the local, state, and regional level to meet current and future transportation needs.



## Active Transportation

- Provide a coordinated and strategic approach to the development of a regional pedestrian and bicycling network that provides greater connectivity between activity centers and cultural amenities.
- Promote and strengthen green infrastructure and natural systems that can build sustainability, reduce emissions, and improve neighborhoods such as the Roanoke Valley Greenways.
- Maintain and improve the certification level of the city's Bicycle Friendly Community Designation.
- Support and promote the expansion of on-street bicycle racks, off-street bicycle parking, and bike sharing.

# Waste Management and Recycling



### Goal:

The City of Roanoke will provide quality waste management services to the citizens and businesses of Roanoke by promoting waste management practices, minimizing waste generation, increasing diversion of solid waste as appropriate, encouraging recycling and reuse, ensuring proper management of generated waste, ensuring the adequate and timely cleanup of the environment, reducing the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of by the agency, and implementing landfilling alternatives.



*Elementary students from Roanoke City Public Schools participated in the "Recycling Heroes Video" to promote single-stream recycling.*

## Targets:

- Increase the city's recycling participation rate from 40 percent in Calendar Year 2012 to 50 percent in Calendar Year 2020.
- Increase the overall recycling rate from 34.1 percent in Calendar Year 2012 to 45 percent in Calendar Year 2016 and 50 percent in Calendar Year 2020.
- Decrease the amount of tonnage delivered to the landfill of the Roanoke Valley Resource Authority from 43,974 to 40,000 tons.

- Increase awareness of the lifecycle impacts of products to address greenhouse gas emissions (GHGs) occurring in the community.

## Strategies:

### Reduce Waste

- Strengthen existing hazardous waste collection and recycling efforts for hazardous items.
- Work with partner organizations to encourage residents and businesses to purchase reused and reusable goods.
- Reduce paper use through duplex printing requirements and purchase printing paper with 30 percent postconsumer content.
- Support and promote the Roanoke Valley Resource Authority's (RVRA) efforts to convert landfill gas to electricity.
- Expand "Green" building programs to promote a reduction in construction and demolition waste.

### Increase Recycling

- Continue to expand the types of materials accepted by the city's recycling program.
- Explore and support the implementation of the single-sort recycling program for curbside pickup.
- Continue to support the establishment of a Material Recycling Facility by the Roanoke Valley Resource Authority.
- Work with the Planning, Building, and Development Department to increase the rate of recycling of construction and demolition debris in the city.
- Enhance outreach and education about recycling and composting to residents and businesses.
- Support incentive programs that mandate the recycling of plastic bags or programs that assign an additional cost for consumers who wish to continue to use plastic bags.



# Water and Storm Management



## Goals:

Sustain and enhance the integrity of the Roanoke Valley water resources and waterways through innovative water management practices, protection of the community's natural resources, promotion of citizen awareness through education and outreach efforts and programs, and the compliance of regulatory requirements of the Municipal Separate Storm Sewer System (MS<sub>4</sub>) permit.

## Targets:

- Reduce non-revenue (unbillable) water from 25 percent to 10 percent by 2020.
- Reduce the tonnage of trash debris collected from water systems and waterways during community clean-up activities.
- Continue to support community leaders in increasing the number of volunteers involved in community waterways clean-up activities from 1,500 to 2,000 by 2020.
- Stencil a minimum of 50 storm drains annually as documented by an annual record of the number and location of marked drains and all participating groups/persons.
- Decrease the number of stormwater violations by 50 percent by 2020 (2013 Baseline).
- Increase the number of citizens that participate in community-sponsored stormwater workshops or activities.
- Increase the number of citizens applying for and receiving approval of Stormwater Utility Fee tax credits for permeable or pervious pavement from the city.
- Annually increase the number of citizens adopting stormwater best management practices for a single-family residence.

## Strategies:

- Support and promote the adoption of water management practices that will reduce water consumption by city facilities and promote water conservation.
- LEED-Certified Construction.
- Stormwater Mitigation.
- Parks and Recreation Initiatives.



*Patrick Henry High School cheerleaders participate in cleaning up the Roanoke River.*



- **Conservation Easements:** In 2008, the city placed 6,185 acres of Carvins Cove under a conservation easement.
- **Encourage and promote the Western Virginia Water Authority's (WVWA) regional efforts to protect the water quality and resources in the Roanoke Valley and to utilize best management and innovative practices to reduce its greenhouse gas (GHG) emissions.**
- **Energy Performance-Based Contracting.**
- **Methane to Electricity.**
- **Biosolids Recycling.**



*Carvins Cove, a major water source within its 12,700 acres, is overflowing with recreation opportunities.*

- **Support responsible consumption of water by residents and visitors.**
- **Establish citizen stream monitoring and clean-up programs, and encourage active participation from community volunteers, governmental entities, and environmental enthusiasts.**
- **Continue compliance with the Commonwealth and Federal Statutes, and continue to improve the city's Municipal Separate Storm Sewer System (MS4) .**
- **Continue to promote cooperation with neighboring jurisdictions to achieve and maintain water quality standards in the city's and region's streams.**
- **Establish long-term dedicated funding mechanisms to improve and maintain stormwater infrastructure.**
- **Maintain a GIS map and object file database for the city storm sewer system, including catchments and outfalls.**
- **Improve public outreach to promote efficient use of available water resources and promote best management practices for stormwater through educational programs, workshops, and demonstrations.**

# Land Use and Conservation

## Goal:

As outlined in the Vision 2001-2020 Comprehensive Plan, Roanoke will work to ensure sustainable land use and urban development, while closely considering the potential consequences of land development patterns and effectively planning to reduce these negative impacts.





## Targets:

- Increase the number of Urban Village Centers by 2020 and improve the existing Village Centers in key locations through the neighborhood planning process.
- Increase urban density to accommodate future population growth within the city's existing urban area.

## Strategies:

- Incorporate best practice sustainability principles into neighborhood planning.
- Inventory and market vacant lots and underutilized land throughout the city for higher-density, mixed-use development.
- Plan for and encourage "Village Centers" in neighborhoods containing a mixture of higher-density residential uses and neighborhood commercial uses.

# Tree Canopy and Preservation

## Goal:

The City of Roanoke will take action to achieve an average tree canopy of at least 40 percent within 10 years through specific policies and actions for three primary themes of the Urban Forestry Plan: 1) Tree Planting on Public Land, 2) Public Tree Management, and 3) Trees on Private Property. The city will work regionally to promote tree planting and tree preservation valley-wide in an effort to improve air quality.

## Targets:

- Maintain an overall tree canopy of 40 percent-plus over the course of the next 10 years through implementation of the actions recommended in the Urban Forest Plan update.

## Strategies:

- Continue to expand the urban tree canopy and achieve an equitable percentage of tree canopy across residential neighborhoods, city parks, street medians, school properties.
- Provide educational opportunities to inform citizens about tree preservation, planting, and maintenance.



*Volunteer Tree Stewards help to plant a tree.*

# Open Space & Recreational Areas

## Goal:

The city will protect its forest, agricultural lands, and recreational areas, as well as its streams, creeks, and rivers from future development through the best conservation approach for each space and based on the following principles: protecting natural resources, maintaining or enhancing air or water quality, preserving the historic or architectural aspects of real property, retaining or protecting the natural or open-space values of real property, and assuring availability of real property for agricultural, forestall, recreational, or open-space use.



*Roanoke has a network of greenways for residents to enjoy, connecting the entire Roanoke area.*

## Target:

- Increase green infrastructure, and open recreational or natural spaces that are within a 10-minute walk of all residents by 2020.

## Strategies:

- Create parks and/or recreational and green spaces in areas with inadequate open space.
- Continue to support efforts that preserve open spaces, farmland, natural beauty, and critical environmental areas throughout the city and conserve significant forested areas using a variety of methods, including conservation easements, etc.



*Fresh fruit and vegetables are available at the Historic Farmers' Market in Downtown Roanoke.*

# Local Food Access and Systems

## Goal:

The city will work to support and promote a sustainable food system that contributes to the health, economic vitality, and social well-being of the Roanoke Valley through collaborative efforts with environmental and food system stakeholders interested in improving access to local and regional food.



## Targets:

- Increase urban agricultural land uses within the Roanoke community.
- Establish five additional community gardens by 2020.

## Strategies:

- Support and promote new opportunities for commercial urban agriculture.
- Support and improve access to farmers markets in neighborhoods with poor access to fresh foods.
- Expand current community gardening and support new opportunities for noncommercial urban agriculture throughout the community.
- Expand current grant opportunities to allow organizations to establish and support urban and community gardens, mobile markets, community kitchens, and food hubs.
- Support and promote the reduction, reuse, or recycling of food-related waste (food composting).
- Establish and facilitate programs that educate the public about food choice as part of a climate-friendly lifestyle.
- Improve the variety of healthy foods offered by mobile vending.



# Special Thanks

**The following people have led and supported the city's Sustainability Program:**

- Roanoke City Council
- Gwen Mason, former City Council Member and creator of the Clean and Green Campaign - 2006-2010
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- Kenneth Cronin, Director of General Services and Sustainability - 2005-2015
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- Office of Communications staff
- All other division managers and staff who embraced sustainability in order to meet our target reduction and protect our environment